

REMARKS

Reconsideration of the subject application is earnestly solicited.

Claims 61 through 115 are pending, with Claims 61, 62, 63, 70, 73, 79, 80, 81, 88, 91, 98, 99, 100, 107, and 110 being independent. Claims 79 through 115 have been added.

STATEMENT UNDER 37 C.F.R. § 1.607(c)

Applicants respectfully submit that the claims — including newly-presented Claims 79 through 115 — have been copied in modified form from Claims 1 through 4 and 6 through 13 of U.S. Patent No. 5,883,732 (Takada, et al.), as shown by the following Table:

TABLE

<u>Takada, et al. claims</u>	<u>subject application claims</u>
1	61, 79, 97/79, 98
2	62, 80, 97/80, 99
3/1	63, 81, 97/81, 100
3/2	73, 91, 97/91, 110
4/3/1	64, 82, 97/82, 101
4/3/2	74, 92, 97/92, 111
5/4/3/1	
5/4/3/2	
6/5/4/3/1	65, 83, 97/83, 102
6/5/4/3/2	75, 93, 97/93, 112
7/6/5/4/3/1	66, 84, 97/84, 103
7/6/5/4/3/2	76, 94, 97/94, 113
8/6/5/4/3/1	67, 85, 97/85, 104

Takada, et al. claims	subject application claims
8/6/5/4/3/2	77, 95, 97/95, 114
9/8/6/5/4/3/1	68, 86, 97/86, 105
9/8/6/5/4/3/2	78, 96, 97/96, 115
10	69, 87, 97/87, 106
11	70, 88, 97/88, 107
12	71, 89, 97/89, 108
13	72, 90, 97/90, 109

RESPONSE TO OFFICIAL ACTION

Claims 61 through 78 were rejected under 35 U.S.C. § 112, 1st paragraph, for lack of written description on the grounds that the recitation “wherein the curvatures in the main and sub-scanning directions are non-symmetrical with respect to the optical axis” is not supported. The Official Action states that, to the contrary, the curvatures in the main scanning direction of the second surface of the imaging lens are symmetrical with respect to the optical axis in Table 5 on page 48 of the subject application and Table 5 on page 27 of Japanese Patent Application No. 8-46741. All rejections are respectfully traversed.

Applicant respectfully submits that the objected-to recitation is supported in each application. As an initial matter, the recitation must be properly construed. Applicant respectfully submits that the recitation includes the words “with respect to the optical axis”, i.e., the reference of the symmetry or non-symmetry is a line, not a plane — if the wording were intended to refer to plane symmetry, then it would have read that “the curvatures in the main and sub-scanning directions are non-symmetrical with respect to a particular plane”. In other words, Applicant respectfully submits that the objected-to recitation refers to rotational asymmetry.

Applicant respectfully submits that this same construction was also adopted in U.S. Patent No. 5,883,732 (Takada, et al.) from which the recitation was copied. There it is stated that “even with lens surfaces that vary continuously in the curvature in the sub-scanning direction, the curvatures in the main and sub-scanning directions will depend on each other if the surfaces are aspheric and symmetric with respect to the optical axis and, therefore, one cannot hold the optical magnification in the sub-scanning direction constant without a sufficient number of the degrees of freedom to achieve simultaneous correction of aberrations in both the main and sub-scanning directions” (col. 5, lines 55-64). Taking this statement and the October 5, 1998 Amendment in Takada, et al., a copy of which was attached to the August 18, 2003 Request for Reconsideration in the subject application as Tab 1, into consideration, Applicant respectfully submits that it can be seen that rotational asymmetry is implicated by the recitation in question. In more detail, that Amendment stated:

In other words, the aspherical surface [of Yamakawa] is defined only by the distance from the optical axis no matter which direction it is. Accordingly, the aspherical surface thus defined is symmetrical around the optical axis. Namely, in Yamakawa, the curvatures in the main and sub-scanning directions must depend on each other since the curvatures are symmetrical around the optical axis.

In amended claim 1, as discussed above, the curvature in the sub-scanning direction can be determined independently from the curvature in the main scanning direction since the surface is not symmetrical around the optical axis.

Amendment, p. 4, lines 17-27 (double underline emphasis added).

The claim language having been construed, Applicant respectfully submits that support may be found for the objected-to recitation in the subject application. Applicant respectfully submits that, for example, the specification states, inter alia, the “lens shape of the $f\theta$ lens in the main scanning direction is an aspherical surface shape which can be represented by a function up to the tenth-order, and the lens shape in the sub scanning direction is comprised of a spherical surface continuously varying in the direction of image height” (e.g., p. 26, lines 19-24; emphasis added), and specific data is also set forth in the specification in table form. Because the shape of the disclosed surface is spherical in the sub-scanning direction and aspherical in the main scanning direction, Applicant respectfully submits that the surface cannot be rotationally symmetrical, in other words, it cannot be a surface of a “body of rotation” which is defined as a “symmetrical body having the form described by rotating a plane curve about an axis in its plane” as set forth in the McGraw-Hill Science Navigator Dictionary (CD-ROM) excerpt attached to the August 18, 2003 Request for Reconsideration as Tab 2. Applicant respectfully submits that if the shape of the lens surface of this embodiment were rotationally symmetrical with respect to the optical axis, then a first curve in a cross-section taken along the vertical plane (extending in the sub-scanning direction) including the optical axis and a second curve in a cross-section taken along the horizontal plane including the optical axis would be the same, whereas in this embodiment the former is spherical and the latter is aspherical as a result of which the lens surface of this embodiment is rotationally non-symmetric. See also, e.g., p. 8, lines 9 to 10 and 27, equations (c) & (d) and Table 1, p. 26, line 25 through p. 28; equation (e) and Table 3, p. 36 through p. 37, line 13; equation (f) and Tables 4 and 5, p. 41, line 25 through p. 42, line 8, and pp. 44, 48; Table 2, Page 32; and Table 6, Page 53. In view of the foregoing, Applicant

respectfully submits that the objected-to recitation is supported by the subject application.

Applicant respectfully submits that support may also be found in Applicant's priority applications, including Japanese Patent Application No. 8-46741 (see, e.g., [0047], [0048], [0075], [0076] and the equations (translation filed March 16, 2000).

Turning to the newly-presented claims, Claims 79 through 97 variously recite that each of the two surfaces is non-symmetrical with respect to the optical axis, which Applicant respectfully submits is supported for the reasons set forth above.

Claims 98 through 115 variously recite that one of the two surfaces is non-symmetrical with respect to the plane containing the optical axis and the sub-scanning direction, which Applicant respectfully submits is supported by, e.g., "B" coefficients set forth in Numerical Embodiment 5 for the first surface of the lens, viz, R is the radius of curvature in the main scanning direction at the center of the lens (optical axis), B4S-B10S are coefficients for determining the curvature (by the associated equation) in the main scanning direction at the left side of the lens, and B4E-B10E are coefficients for determining the curvature (by the associated equation) in the main scanning direction at the right side of the lens — as can be seen, the coefficients are not the same for one surface, so the curvature in the main scanning direction is not in plane symmetry with respect to the reference plane.

Separate and individual consideration of each dependent claim is respectfully requested.

REQUEST FOR INTERVIEW

Applicant respectfully requests that the Examiner contact Applicant's undersigned representative to schedule a personal interview.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,



Attorney for Applicant

Daniel S. Glueck

Registration No. 37,838

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3800
Facsimile: (212) 218-2200
DSG/dc

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